

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
18 March 2004 (18.03.2004)

PCT

(10) International Publication Number  
**WO 2004/023705 A1**

- (51) International Patent Classification<sup>7</sup>: **H04L 1/06**, 1/00
- (21) International Application Number:  
PCT/GB2003/003741
- (22) International Filing Date:  
1 September 2003 (01.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
0220399.0 3 September 2002 (03.09.2002) GB
- (71) Applicant (for all designated States except US): **QINETIQ LIMITED** [GB/GB]; Registered Office, 85 Buckingham Gate, London SW1 6PD (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **FLETCHER, Paul, Nicholas** [GB/GB]; Merchant Ventures Building, University of Bristol, Woodlands Road, Bristol BS8 1UB (GB). **DEAN, Michael** [GB/GB]; QinetiQ Limited, Malvern Technology Centre, St. Andrews Road, Malvern, Worcestershire, WR14 3PS (GB). **PIECHOCKI, Robert**,

**Jan** [PL/GB]; Merchant Ventures Building, University of Bristol, Woodlands Road, Bristol, BS8 1UB (GB). **NIX, Andrew** [GB/GB]; Merchant Ventures Building, University of Bristol, Woodlands Road, Bristol BS8 1UB (GB). **CANAGARAJAH, Nishan** [GB/GB]; Merchant Ventures Building, University of Bristol, Woodlands Road, Bristol BS8 1UB (GB). **MC, GEEHN, Joe** [GB/GB]; Merchant Ventures Building, University of Bristol, Woodlands Road, Bristol BS8 1UB (GB).

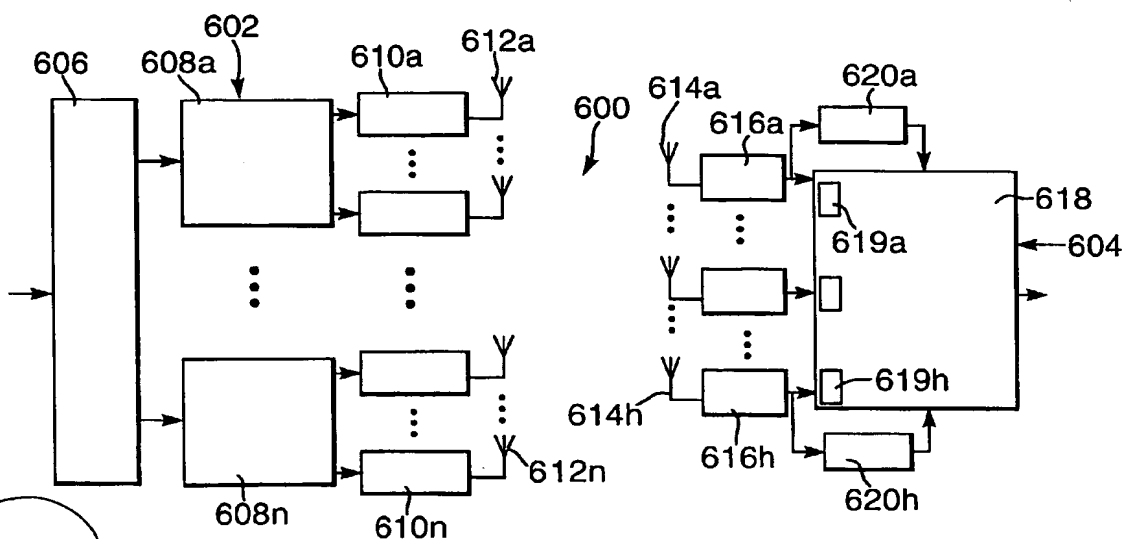
(74) Agent: **DAVIES, P.**; IP QinetiQ Formalities, Cody Technology Park, A4 Building, Room G016, Ively Road, Farnborough, Hampshire GU14 0LX (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: MAXIMUM LIKELIHOOD BASED INTERFERENCE CANCELLATION FOR SPACE-TIME CODED SIGNALS



(57) Abstract: A signal processing apparatus (604) comprises a plurality of receiving elements (614a-h), weighting means (616a-h), and decoding means (618). Each of the receiving elements (614a-h) has respective weighting means (619a-h) associated therewith at the decoding means (618), and is arranged to receive a plurality of signals transmitted from a plurality of transmitters (612a-n). The weighting means (616a-h) are arranged to apply a complex weighting function to each of a number of the signals received by the receiving elements (614a-h) at a given frequency in order to null the number of signals. The decoding means (618) are arranged to determine a symbol or codeword associated with a non-nulled signal and to incorporate the symbol or codeword in the determination of at least one further symbol or codeword.